

# Final NoSQLAssignment\_One-Five O-Five

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## NoSQL Assignment

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## **I. Data Selection**

### **A. Purposes of data**

The purpose that we select this data is we see the insight of tv shows and movies on Netflix whether type, genres, and rating.

### **B. Data Model**

1. **Show\_id** – This column contains the id of the show on Netflix (Format: stxxx).
2. **Type** – This column contains the type of show on Netflix.
3. **Title** – This column contains the title name of the show on Netflix.
4. **Director** – This column contains the name of the director of each show on Netflix.
5. **Cast** – This column contains the name of the actor or actress of each show on Netflix.
6. **Country** – This column contains the country that produces the show which is published on Netflix.
7. **Date\_added** – This column contains day, month, and year of the show that was published on Netflix.
8. **Realease\_year** – This column contains the year of the show that was published on Netflix.
9. **Rating** – This column contains the type of movie rating of each show on Netflix.
10. **Duration** – This column contains the time duration of the show on Netflix.
11. **Genres** – This column contains the genres of the show on Netflix.
12. **Description** – This column contains the description of the show on Netflix.

### **C. Motivation**

We do it for people who like movies and want to see information about movies of interest such as who is the director or where the movie is made and can show users the type of movie they like or are interested in.

## II. NoSQL Technology Selection

### A. Main Features

The main feature used in this assignment is MongoDB technology. MongoDB is an open-source NoSQL Database that provides a document-oriented database regarding JSON-like documents. [1] It can perform data without any data structures to query faster than RDBMS. Additionally, MongoDB is appropriate for CAP theorem-based hierarchical data storage (Consistency, Availability, and Partition tolerance) and also has main features including [2]

- **Schema-less Database** – A collection with the ability to store various document kinds is provided by a schema-less database. Users may quickly insert a variety of data formats, regardless of the size, content, or number of fields. Unlike the RDBMS, a document cannot be comparable to another document.
- **Scalability** – With the use of the Shard key, a vast amount of data can be divided into manageable sections because MongoDB can distribute data across various servers. The distribution of those data units across Shards, which are spread across various Physical Servers, is also uniform.
- **Replication** – By making multiple copies of the data and delivering each copy to a different server, MongoDB offers high availability and redundancy. If one server fails, users may still access the data from the other servers.
- **Indexing** – There is less time required to get and search the data in each document because every item within documents is indexed in both primary and secondary indices.

### B. Tools and Services

There are several tools, applications, and services that could be used to develop the NoSQL script. However, we came up with three technologies that are important and famous technologies providing built-in platforms, online document databases, and cloud services. The three technologies are included as follows:

- **NoSQL Booster for MongoDB**

[1] NoSQL Booster is a cross-platform utility for MongoDB that has a graphical user interface (GUI) and numerous built-in. [3] NoSQL Booster is

pleased with its capacity to automatically complete collection names, techniques, keywords, and properties. Additionally, it offers a number of capabilities and could construct a script query more quickly including:

- **Chaining Fluent Query Interface** – NoSQL Booster provides a fluent query builder API that allows query construction using chaining syntax.
- **Re-Schema Tool** – The MongoDB Collection Schema can be updated using the GUI provided by the re-schema tool. Users who update by making a few clicks are essentially creating a code.
- **One Click Grouping and Filtering** – The query results can be grouped using the One-Click grouping tool to compute statistics for the selected field.
- **Test Data Generator** - Test Data Generator can produce arbitrary phony data for testing needs. False data can imitate real data because the owner of the data cannot always control its distribution and usage. Users could thereby guarantee statistical significance without any limitations.

- **MongoDB Atlas**

With MongoDB Atlas, a managed service cloud database, they can easily install, maintain, and repair their deployments on the cloud-based service provider of their choosing (AWS, Azure, and GCP). Employing MongoDB Atlas is the most effective way to set up, execute, and scale MongoDB on the cloud. A MongoDB database may be launched fast and easily using Atlas using a few clicks. [4] The MongoDB Atlas has a number of functionalities, including: [5]

- **Built-in Automation Features** – Users of MongoDB Atlas can improve their competitiveness by using automation tools for database administration.
- **Easier Scalability** – Applications and systems must respond to unforeseen requirements as well as the company's typical growth rate. A NoSQL database called MongoDB uses a method called Sharding to provide horizontal scalability.

- **Strong Security Measures** – The approach used by MongoDB Atlas is multilayered. Authentication, authorization, encryption, and other security capabilities are available in MongoDB Atlas. These attributes strengthen security and help stop data leaks.
- **Extensive Analytics and Monitoring** – Built-in tracking and monitoring features in MongoDB Atlas offer helpful details about the functionality of your database. Additionally, it receives real-time insights into its server clusters and creates customized alerts, enabling users to address problems before they have an impact on performance or the end-user experience.

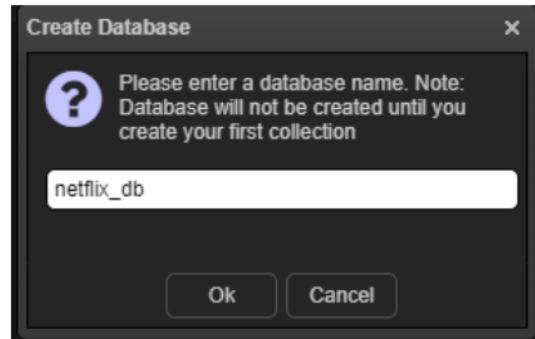
- <sup>6</sup> **Google Cloud Platform (GCP)**

Google cloud platform or GCP is the public cloud that has various services such as Big Data, IoT, Data storage or etc. It can assist the user in creating a server or application that uses MongoDB and Google Cloud to simplify working with data and relieve the application teams and developers of operational burdens. [6] There are several features in GCP as follows:

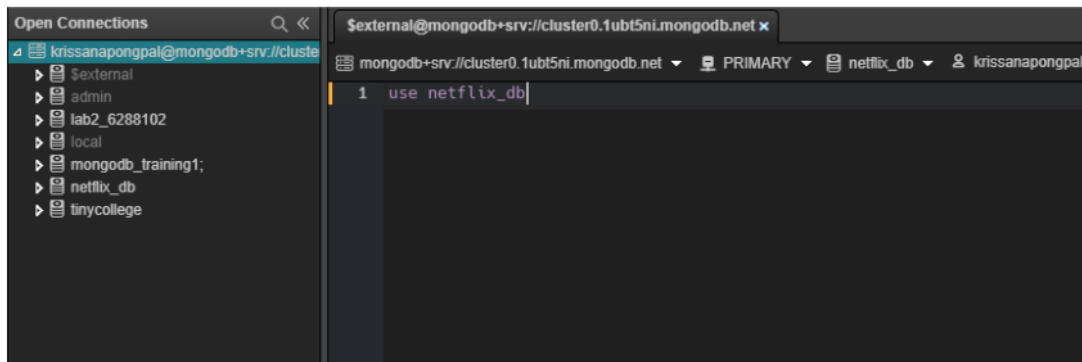
- **Fault Tolerance and High Availability** – GCP makes sure that applications are not just consistently and conveniently accessible, but also very resilient to difficulties. The availability of GCP's services and products is also intended to assist with application deployment concerns.
- **Scalability and Elasticity** – The built-in services of Google Cloud allow for automatic application scaling and load distribution. In addition, Users can automatically add or delete instances and set a policy that scales up or down the number of instances based on measured load and target utilization using Managed Instance Groups, a feature of GCP that allows you to manage identical instances as a single entity in a single zone.
- **Disaster Recovery** – GCP has a robust global network, redundant points of presence throughout the world, a scalable service infrastructure, a highly secure network, and is generally privacy compliant, all of which help it meet an application's SLA needs.

### III. NoSQL Implementation

#### A. Database Creation



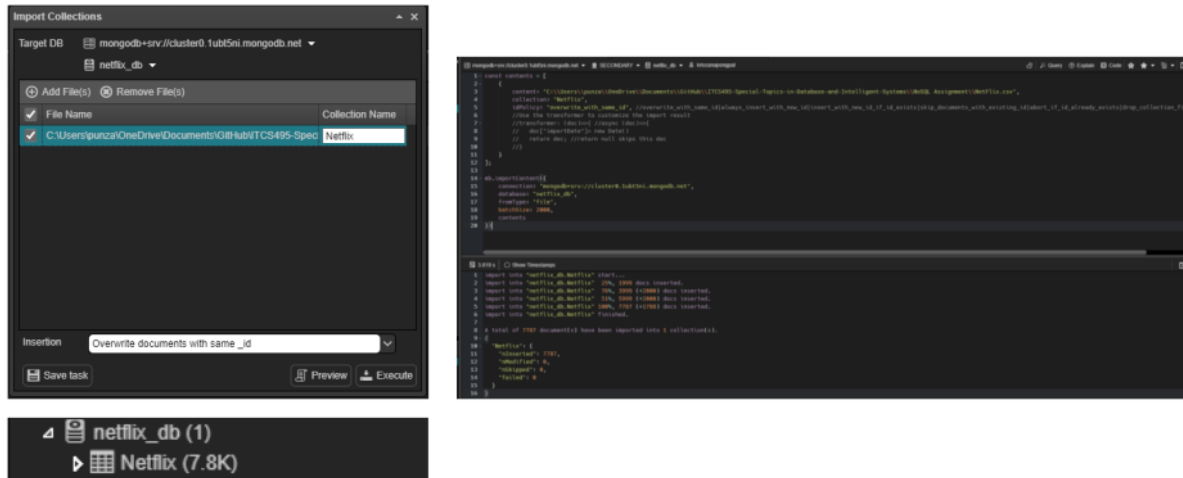
Firstly, we create the current database that we are working with. We will set the name of the database as “netflix\_db”. After that, we click the “Ok” button, the MongoDB will create the database.



After MongoDB creates the database, the database will show on the left of the program. Then, we call to use the "netflix\_db" command to use the database we are working with. Finally, we will change the database type to “netflix\_db”.



## B. Data Import



After we create the database, we import the collection name “Netflix” to “netflix\_db” as a target DB and select “Overwrite documents with same\_id” for the insertion. Finally, select the execute to show up in the Netflix collection and continuously work with it.

### C. Testing Data Queries

- Query the Restricted movies that show title, type, rating, and title show in ascending order

```
db.Netflix.find({rating: 'R'}, {title: 1, type: 1, rating: 1}).sort({title: 1})
```

For the first query, we want to find the restricted movies and show the title, type, rating, and title show in ascending order. We write a find command that the rating is 'R' and use the projection to specify the title, type, and rating. We add a “sort function” to sort the tile in ascending order.

**Result:**

id	type	title	rating
15	Movie	Black Sea	R
16	Movie	Black Snake Moan	R
17	Movie	Blaze	R
18	Movie	Blood for This	R
19	Movie	Blood Father	R
20	Movie	Blow	R
21	Movie	Blue Mountain State: The Rise of Thaddeus	R
22	Movie	Blue Rush	R
23	Movie	Blue Valentine	R
24	Movie	Bonnie and Clyde	R
25	Movie	Born Racer	R
26	Movie	Boys: Undisputed	R
27	Movie	Braves	R
28	Movie	Breck	R

- Query movies after or equal to 2010 that show type, title, director, cast, country, rating, duration, genres, description, and genres is action.

```
db.Netflix.find({
  release_year: {$gte: 2010},
  genres: {$regex: /^Action.*/}
},
{
  type:1, title:1, director:1, cast:1, country:1, release_year:1, rating:1, duration:1, genres:1, description:1
})
```

For the second query, we want to find the action movies that have the release year after 2010 and show the result as type, title, director, cast, country, rating, duration, genres, and description. We write a find command that release\_year is greater than or equal to 2010 and genres use regex for find pattern matching that we find the pattern is “Action” and use the projection to specify type, title, director, cast, country, rating, duration, genres, description.

### Result:

_id	type	title	director	cast	country	release_year	rating	duration	genres	description
59	4335c968ba32c19c19c	John Carter	Andrew Stanton	Taylor Kitsch, Lynn Collins	United States	2012	PG-13	133	Action & Adventure, Sci-Fi	One minute, Civil War veteran John Carter is evading A
60	4335c967ba32c19c19c	Kill Rate	Paul Tanter	Tom Hopper, Amy Huberman	United States	2016	TV-MA	87	Action & Adventure	Posing as a telecom salesman at a business conference
61	4335c968ba32c19c19c	Crouching Tiger, Hidden Dr	Yuen Wo-Ping	Michelle Yeoh, Donnie Yen	China, United States	2016	PG-13	101	Action & Adventure, Romance	Renowned warrior Yu Shu-Lien comes out of retirement
62	4335c968ba32c19c19c	Judges 2	David Dhawan	Varun Dhawan, Jacqueline	India	2017	TV-14	145	Action & Adventure, Comedy	Separated at birth, twins Raju and Prem couldn't be mor
63	4335c967ba32c19c19c	Kickboxer: Retaliation	Dimitri Logothetis	Alan Mousas, Jean-Claude	United States	2017	R	110	Action & Adventure	Stoat's vow to never return to Thailand is cut short whe
64	4335c968ba32c19c19c	Bayka: Undisputed	Todor Chapkanov	Scott Adkins, Teodora Duh	Bulgaria, United States	2016	R	90	Action & Adventure	The fourth film in the action franchise finds Bayka taki
65	4335c968ba32c19c19c	Jana 19 Numbani	Ananddeep Singh Gill	Deep Sidhu, Chamekendra	India	2017	TV-MA	135	Action & Adventure, Drama	The wounds of a traumatic childhood and a corrupt, v
66	4335c968ba32c19c19c	Dart Crack Under Pressur	Theory Donard	David Camero, Jesse Rich	France	2015	TV-MA	95	Action & Adventure, Drama	There are risks. Then there are risk-takers. In an armo
67	4335c967ba32c19c19c	Kill the Irishman	Jonathan Hanleigh	Ray Stevenson, Vincent D'	United States	2011	R	106	Action & Adventure, Drama	This true crime tale charts the rise and fall of mobster G
68	4335c968ba32c19c19c	Dethi Belly	Abhinav Deo	Imran Khan, Vih Dae, Kuma	India	2011	TV-MA	101	Action & Adventure, Comedy	Three fishermen get involved in the shady business bet
69	4335c968ba32c19c19c	Dart Crack Under Pressur	Theory Donard	Tenavat Bullard, David Ca	France	2017	TV-14	94	Action & Adventure, Drama	Through deserts, above mountains and deep into scree
70	4335c968ba32c19c19c	Dart	Julius R. Nassio	Tony Schenna, Armand Azo	United States	2016	TV-MA	98	Action & Adventure, Drama	To bring down a global human trafficking ring, an int
71	4335c968ba32c19c19c	I Am Vengeance: Retaliato	Ross Boyask	She Bennett, Vinnie Jones	United Kingdom	2020	R	82	Action & Adventure	To clear his criminal record, an ex special forces sol
72	4335c968ba32c19c19c	Cann	Henrik Martin Dahlsbakken	Josh Tuck, Benjamin Lach	Norway	2016	TV-MA	77	Action & Adventure, Drama	Tom between old camaraderie and recent tensions, tom

- Query movies' type, title, director, rating, genres, and description that rating is TV-14 or PG-13, also genre is international both movies and TV shows, or title contains “S” at the first letter

```
db.Netflix.find({
  $and: [
    { $or: [
      {rating: 'TV-14'},
      {rating: 'PG-13'}
    ]},
    { $or: [
      {genres: {$regex: /International.*/}},
      {title: {$regex: /^h.*/}}
    ]}
  ]
},
{
  type: 1, title: 1, director: 1, rating: 1, genres: 1, description: 1
})
```

The third query is created in order to find the Netflix movies and TV shows that rating “TV-14” or “PG-13” representing content for teens. Moreover, the query not only finds a rating but also contains “International” genres or titles containing “H” at the first letter. We start by using “\$and” in order to retrieve both ratings and others. In the first code for “\$and”, we use “\$or” in order to choose ratings for both “TV-14” and “PG-13”. [7] In the second code for “\$and”, we also use “\$or” in order to choose genres that contain “International” or title that contains “H” at the first letter by using “\$regex” for both scripts. In addition, we also conduct the projection that we set it to 1 in order to represent an only type, title, director, rating, genres, and description from queries.

### Result:

49	4335c988a3211b1616c	Movie	3.5/5	Bano Jaijagan	TV-14	Drama, International Movies, Thrillers	Against the backdrop of Nepal's ongoing independence from Britain, detective Subash SP
50	4335c979a3211b1616c	Movie	Atisha Aur 40 Chor	Laff Fatiyyen, Umash Mehra	TV-14	Action & Adventure, International Movies, Sci-Fi & Fantasy	A simple village man is thrown into a web of political intrigue after he takes on a powerful a
51	4335c969a3211b1616c	Movie	Amritsar: A Revolution in Four Part Harmony	Lee Hirsch	PG-13	Documentaries, International Movies, Music & Musical	This documentary recounts the fascinating and little-known rise that made him played in th
52	4335c969a3211b1616c	Movie	300 Miles to Heaven	Marco Dezzio	TV-14	Drama, International Movies	Hoping to help their disabled parents, two brothers sneak out of Poland and land as refug
53	4335c969a3211b1616c	Movie	5 Star Christmas	Marco Risi	TV-14	Comedies, International Movies	When the Italian prime minister meets his lover and politician that while on an official trip to
54	4335c969a3211b1616c	Movie	A Love Story	Maryo J. De los Reyes	TV-14	Drama, International Movies, Romantic Movies	Self-made millionaires (an thrice he's found happiness when he marries caring Joanna, but
55	4335c969a3211b1616c	Movie	Song	Miloš Forman	TV-14	Comedies, International Movies	To keep the band together, Sully tries to earn money by making an appearance at the bette
56	4335c969a3211b1616c	Movie	ATM	Mani Taseem	TV-14	Comedies, International Movies, Romantic Movies	When a broken ATM dishes out a fortune, a couple who works at the bank sets to see who
57	4335c969a3211b1616c	Movie	Bugs: the movie	Michael Margold	TV-14	Documentaries, International Movies	This passionate documentary explores how our fellow friends became urban icons, from th
58	4335c969a3211b1616c	Movie	Agneepath	Mukul Arund	TV-14	Drama, International Movies	A boy grows up to become a gangster in pursuit of the mobster who killed his innocent fat
59	4335c969a3211b1616c	Movie	Arjun	N. Linguswamy	TV-14	Action & Adventure, Drama, International Movies	Mild-mannered Krishna comes to Mumbai to search for his gang leader brother, and quick
60	4335c969a3211b1616c	Movie	Aashayein	Nagesh Kukunoor	TV-14	Drama, International Movies	When he learns he has terminal cancer, a cynical gambler and chronic smoker ditches his
61	4335c969a3211b1616c	Movie	A Silent Voice	Naoko Yamada	TV-14	Anime Features, International Movies	A former class bully reaches out to the deaf girl he'd tormented in grade school. He feels o
62	4335c969a3211b1616c	Movie	A Tale of Love and Darkness	Natasha Portman	PG-13	Drama, International Movies	Based on the memoirs of author Amos Oz, this poetic drama shares his family's tale of su
63	4335c969a3211b1616c	Movie	10 years on or	Nicolas Breuille	TV-14	Comedies, Drama, International Movies	When a carefree bachelor is unexpectedly left in charge of a young boy, the two embark on
64	4335c969a3211b1616c	Movie	Among Family	Ozan Aygün	TV-14	Comedies, International Movies	Amid a marital crisis, Filiz befriends songstress Sönmaz after a wacky encounter and me
65	4335c969a3211b1616c	Movie	A Billion Colour Story	Padmakumar Narasimhamurthy	TV-14	Drama, Independent Movies, International Movies	The curious child of idealistic interfaith parents observes an increasingly intolerant worl
66	4335c969a3211b1616c	TV Show	Alulah Balga	Pall Vahya	TV-14	International TV Shows, TV Dramas	A little girl must enter an orphanage after her parents are arrested, but her life takes a dr
67	4335c969a3211b1616c	Movie	Aarakshan	Prakash Jha	TV-14	Drama, International Movies	The decision by India's supreme court to establish caste-based reservations for jobs in edu
68	4335c969a3211b1616c	Movie	Aamir	Raj Kumar Gupta	TV-14	International Movies, Thrillers	In this high-tension thriller, an anonymous caller on a cell phone threatens to harm a m
69	4335c969a3211b1616c	Movie	Aashri Adaalat	Rajiv Mehra	TV-14	Action & Adventure, International Movies	An intrepid police inspector forced into a desk job must take matters into his own hands, w
70	4335c969a3211b1616c	Movie	3 idiom	Rajkumar Hirani	PG-13	Comedies, Drama, International Movies	While attending one of India's premier colleges, three inseparable engineering students an

### D. NoSQL Service Information

We conduct this assignment by using the MongoDB services. However, in order to access the MongoDB databases, users are required to access via NoSQL Booster for MongoDB by following these steps:

1. Open the NoSQL Booster for MongoDB on your computer
2. Open a connection and connect from URI and insert  
“mongodb+srv://krissanapongpal:za4DwPWLW560O13X@cluster0.1ubt5ni.mon  
godb.net/test”
3. Using a database named “netflix\_db” and collection “Netflix” in order to retrieve a data

## IV. References

- [1] R. Tiwari, "NoSQLBooster For MongoDB Simplified: A Comprehensive Guide 101," 16 February 2022. [Online]. Available: <https://hevodata.com/learn/nosqlbooster/#con>. [Accessed 29 September 2022].
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